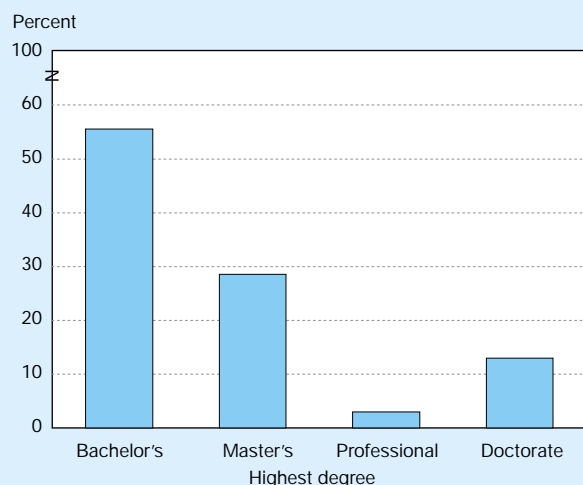
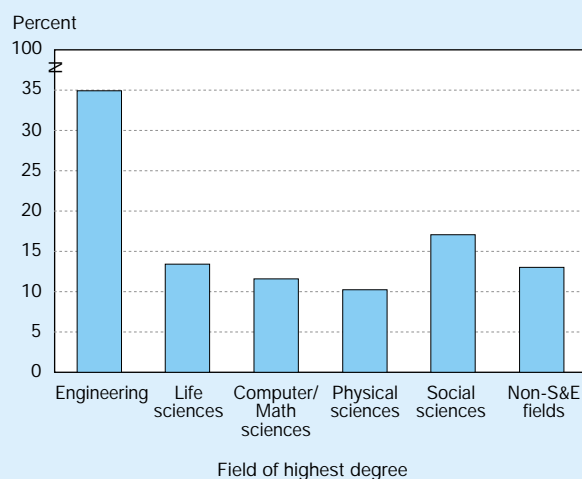


Figure 3-6.  
Distribution of S&E R&D workers by degree level



See appendix table 3-26. *Science & Engineering Indicators – 2000*

Figure 3-7.  
Distribution of S&E R&D workers by field of highest degree



See appendix table 3-26. *Science & Engineering Indicators – 2000*

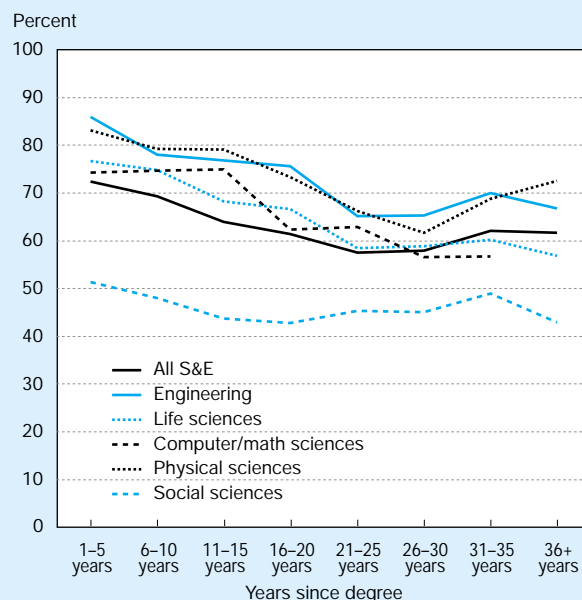
expected, which may reflect a normal career process of movement into management or into other career interests.

## Women and Minorities in S&E

This section examines the participation and employment characteristics of women and minorities in the S&E labor force in 1997. Representation is examined, in most cases, in terms of age, time in workforce, field of employment, and highest degree level.<sup>11</sup> These factors influence employment patterns.

<sup>11</sup>Throughout this section, scientists and engineers are defined in terms of field of employment, not degree field.

Figure 3-8.  
Percentage of S&E Ph.D. holders engaged in R&D as a major work activity



See appendix table 3-27. *Science & Engineering Indicators – 2000*

To the extent that men and women, minorities, and nonminorities differ on these factors, their employment patterns are likely to differ as well.

Within the S&E labor force, the age distributions of women compared to men, and of minorities compared to the majority, are quite different. Because large numbers of women and minorities have entered S&E fields only relatively recently, women and minority men are generally younger and have fewer years of experience. (See appendix table 3-9.) Age or stage in career is an influence on such employment-related factors as salary, rank, tenure, and work activity. Employment patterns also vary by field, and these field differences may influence employment in S&E jobs, unemployment, salaries, and work activities. Highest degree earned is also an important influence on employment, particularly on primary work activity and salary.

## Women Scientists and Engineers

### Representation in S&E

Women were slightly more than one-fifth (23 percent) of the S&E workforce, but close to half (46 percent) of the U.S. labor force in 1997. Although changes in the NSF surveys do not permit analysis of long-term trends in employment, short-term trends show some increase in the representation of women with doctorates in S&E employment: women represented 23 percent of scientists and engineers with doctorates in the United States in 1997. (See appendix table 3-10.) In 1993, they represented 20 percent and in 1995 22 percent.<sup>12</sup>

## Work Experience

Many of the differences in employment characteristics between men and women are partially due to differences in time since receipt of degree. Women in the S&E workforce are younger, on average, than men: 49 percent of women and 35 percent of men employed as scientists and engineers in 1997 had received their degrees within the previous 10 years.

## Field of S&E Occupation

As is the case in degree fields, women and men differ in field of employment. Women are more highly represented in some S&E fields than in others. For example, women were more than half of social scientists, but only 22 percent of physical scientists and 9 percent of engineers. (See figure 3-9.) Within engineering, women are also more highly represented in some fields than in others. For example, women represented 12 percent of chemical and industrial engineers, but only 6 percent of aerospace, electrical, and mechanical engineers.

## Educational Background

In many occupational fields, women scientists have attained a lower level of education than men. In the science workforce as a whole, 16 percent of women and 20 percent of men hold doctoral degrees. In biology, 26 percent of women and 42 percent of men hold doctoral degrees; in chemistry, 14 percent of women and 28 percent of men hold doctoral degrees; and in psychology, 24 percent of women and 40 percent of men hold doctoral degrees. Differences in highest de-

gree influence the type of work performed, employment in S&E jobs, and salaries. In engineering, only about 5 percent of both men and women have doctoral degrees. (See NSF 1999b.)

## Labor Force Participation, Employment, and Unemployment

Men scientists and engineers are more likely than women to be employed full-time and to be employed in their field of highest degree. Women are more likely than men to be employed part time, and to be employed outside their field. Some of these differences may reflect differences in the age distributions of men and women or family-related reasons, such as the demands of a spouse's job or the presence of children.

The labor force participation rates of men and women with current or former S&E occupations are similar—87 percent of women and 88 percent of men are in the labor force. (See appendix table 3-11.) Conversely, 13 percent of women and 12 percent of men are not in the labor force—that is, not working and not seeking employment. Among those in the labor force, moreover, unemployment rates of men and women scientists and engineers varied somewhat: 2.2 percent of women and 1.4 percent of men were unemployed in 1997.

## Sectors of Employment

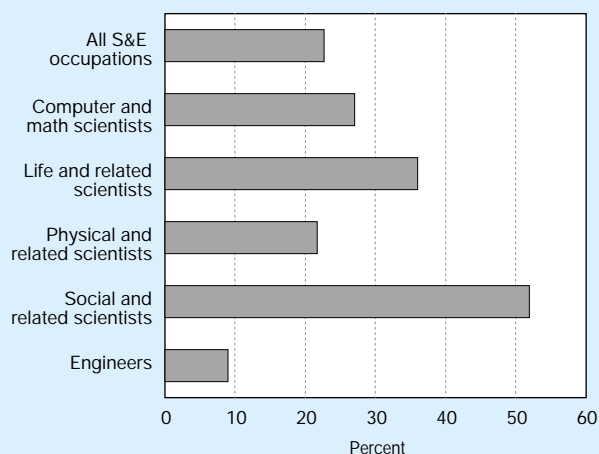
Within fields, women are about as likely as men to choose industrial employment. For example, among physical scientists, 54 percent of women and 55 percent of men are employed in business or industry. (See appendix table 3-12.) Among employed scientists and engineers as a whole, however, women are less likely than men to be employed in business or industry and are more likely to be employed in educational institutions: 49 percent of women and 67 percent of men are employed in for-profit business or industry and 27 percent of women and 15 percent of men are employed in educational institutions. These differences in sector, however, are mostly related to differences in field of degree. Women are less likely than men to be engineers or physical scientists, who tend to be employed in business or industry.

## Salaries

In 1997, the median annual salary for women scientists and engineers was \$47,000, about 20 percent less than the median salary for men (\$58,000). (See figure 3-10 and appendix table 3-8). The salary differential could be due in part to several factors. Women were more likely than men to be working in educational institutions and in social science occupations, in nonmanagerial positions, and to have fewer years since receipt of degree, all of which are related to salary differences. Among scientists and engineers in the workforce who have held their degrees five years or less, the median annual salary of S&E women was 83 percent of that for men.

The salary differential varied greatly by broad field. In computer and mathematical science occupations in 1997, women's salaries were approximately 12 percent less than men's, whereas there was a 24 percent salary difference in social science and life science occupations. As with men,

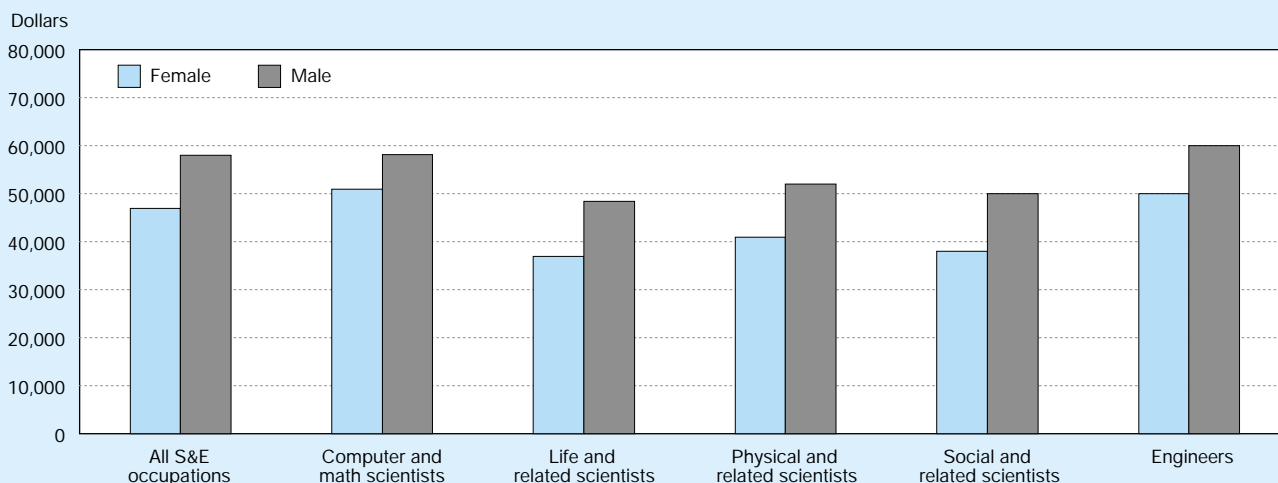
Figure 3-9.  
Proportion of women in S&E workforce by broad occupation: 1997



See appendix table 3-10. Science & Engineering Indicators – 2000

<sup>12</sup>For 1995 figures, see *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1998* (NSF 1996, p. 99). For 1993 figures, see *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1996* (NSF 1999b, p. 63).

Figure 3-10.

**Median annual salaries of employed scientists and engineers, by broad occupation and sex: 1997**

NOTE: Individuals are characterized as scientists or engineers based on their current occupation.

See appendix table 3-8.

*Science & Engineering Indicators – 2000*

women earned the highest median salary in computer and mathematical sciences (\$51,000) and the lowest in life sciences (\$37,000).

## Racial or Ethnic Minority Scientists and Engineers

### Representation in S&E

With the exception of Asians, minorities are a much smaller proportion of scientists and engineers in the United States than they are in the total U.S. population.<sup>13,14</sup> Asians comprised 10 percent of scientists and engineers in the United States in 1997, although they were 4 percent of the U.S. population. Blacks (12 percent), Hispanics (11 percent), and American Indians (1 percent) as a group were 24 percent of the U.S. population and 7 percent of the total S&E labor force in 1997.<sup>15</sup> Blacks and Hispanics each comprised about 3 percent and

Native Americans less than half of 1 percent of scientists and engineers. (See appendix table 3-13.)

### Work Experience

The work experience of minority scientists and engineers, including Asians, differs from that of white scientists and engineers. As noted earlier, these differences influence differences in employment characteristics. About 36 percent of white scientists and engineers employed in 1997 had received their degrees within the previous 10 years, compared with between 47 and 52 percent of Asian, black, and Hispanic scientists and engineers. (See appendix table 3-14.)

### Field of S&E

Black, Asian, and American Indian scientists and engineers are concentrated in different fields than white and Hispanic scientists and engineers. Asians are less represented in social sciences than they are in other fields. They represented 4 percent of social scientists, but more than 10 percent of engineers and computer scientists. Black scientists and engineers work more in social sciences and in computer and mathematical sciences than in other S&E fields. They represent 5 percent of social scientists, 4 percent of computer and mathematical scientists, and roughly 3 percent or less of physical scientists, life scientists, and engineers. Although the numbers are small, American Indians appear to be more concentrated in the social sciences. They represent 0.6 percent of social scientists and 0.4 percent or less of workers in other fields. Hispanics represent roughly 2.5 to 4 percent of scientists and engineers in each field.

<sup>13</sup>The term "minority" includes all groups other than white; "under-represented minorities" include three groups whose representation in S&E is less than their representation in the population: blacks, Hispanics, and American Indian/Alaska Natives. In accordance with Office of Management and Budget guidelines, the racial or ethnic groups described in this section will be identified as white and non-Hispanic; black and non-Hispanic; Hispanic; Asian or Pacific Islander; and American Indian/Alaskan Native. In text and figure references, these groups will be referred to as white, black, Hispanic, Asian, and American Indian.

<sup>14</sup>The data reported in this section include all in S&E occupations, regardless of citizenship or country of origin, unless otherwise noted.

<sup>15</sup>The S&E fields in which blacks, Hispanics, and American Indians earn their degrees influence participation in the S&E labor force. Blacks, Hispanics, and American Indians are disproportionately likely to earn degrees in the social sciences (included by NSF as degrees in S&E) and to be employed in social services occupations, such as social work, clinical psychology, that are defined by NSF as non-S&E occupations. See NSF 1999a for NSF's classification of S&E educational and occupational fields.

### **Educational Background**

The educational attainment of scientists and engineers differs among racial or ethnic groups. Black scientists and engineers, on average, have a lower level of education than scientists and engineers of other racial or ethnic groups. Black scientists and engineers are more likely than white, Hispanic, or Asian scientists and engineers to have a bachelor's degree as the terminal degree: 64 percent of black scientists and engineers in the U.S. workforce have a bachelor's degree as the highest degree compared to 57 percent of all scientists and engineers in 1997. (See appendix table 3-10.)

### **Labor Force Participation, Employment, and Unemployment**

Labor force participation rates vary by race or ethnicity. Minority scientists and engineers were more likely than whites to be in the labor force, that is, employed or looking for employment. Between 91 and 95 percent of black, Asian, Hispanic, and American Indian scientists and engineers were in the labor force in 1997, compared with 87 percent of white scientists and engineers. (See appendix table 3-13.) Age differences are part of the explanation. White scientists and engineers are older, on average, than scientists and engineers of other racial or ethnic groups: 25 percent of white scientists and engineers were age 50 or older in 1997, compared with between 15 and 18 percent of Asians, blacks, and Hispanics. Among those in similar age groups, the labor force participation rates of white and minority scientists and engineers are similar. (See NSF 1999b.)

Although minorities, for the most part, are less likely to be out of the labor force, among those who are in the labor force, minorities are more likely to be unemployed. In 1997, the unemployment rate of white scientists and engineers was significantly lower than that of other racial or ethnic groups. The unemployment rate for whites was 1.4 percent, compared with 2.6 percent for Hispanics, 1.9 percent for blacks, and 2.0 percent for Asians. The differences in unemployment rates were evident within fields of S&E, as well as for S&E as a whole. For example, the unemployment rate for white engineers was 1.6 percent; for black and Asian engineers, it was 2.5 percent and 2.1 percent, respectively.

### **Sectors of Employment**

Racial or ethnic groups differ in employment sector, partly because of differences in field of employment. Among employed scientists and engineers in 1997, 57 percent of black, 58 percent of Hispanic, and 50 percent of American Indian, compared with 63 percent of white and 67 percent of Asian scientists and engineers were employed in for-profit business or industry. Blacks and American Indians are concentrated in the social sciences, which are less likely to offer employment in business or industry, and are underrepresented in engineering, which is more likely to offer employment in business or industry. Asians, on the other hand, are overrepresented in engineering and thus are more likely to be employed by private for-profit employers.

Black, Hispanic, and American Indian scientists and engineers are also more likely than other groups to be employed in government (Federal, state, or local): 22 percent of black, 16 percent of Hispanic, and 19 percent of American Indian scientists and engineers were employed in government in 1997, compared with 13 percent of white and 12 percent of Asian scientists and engineers.

### **Salaries**

Salaries for scientists and engineers vary somewhat among racial or ethnic groups. Among all scientists and engineers, the median salaries by racial or ethnic group are \$55,000 for whites and Asians, \$48,000 for blacks, \$50,000 for Hispanics, and \$46,000 for American Indians. (See figure 3-11 and appendix table 3-16.) Within fields and age categories, median salaries of scientists and engineers by race or ethnicity are not dramatically different and do not follow a consistent pattern. For example, the median salary of engineers with bachelor's degrees who are between the ages of 20 and 29 ranged from \$40,000 for Hispanics to \$44,000 for Asians. Among those between the ages of 40 and 49, the median salary ranged from \$55,000 for Hispanics to \$62,600 for whites. Looking at time in the work force, the median salary of engineers with bachelor's degrees in 1997 who had received their degree within the last five years was \$40,000 for all ethnicities. (See appendix table 3-17.) Among those who had received their degrees 20–24 years before, the median salary was approximately \$65,000 for all ethnicities.

## **Labor Market Conditions for Recent S&E Degree-Holders**

### **Bachelor's and Master's Degree Recipients<sup>16</sup>**

Recent S&E bachelor's and master's degree recipients form a key component of the Nation's S&E workforce; they account for almost half the annual inflow to the S&E labor market. The career choices of recent graduates and their entry into the labor market affect the balance between the supply of and demand for scientists and engineers in the United States. Analysis of the workforce status and other characteristics of recent S&E graduates can yield valuable labor market information.

This section provides several labor market measures that offer useful insights into the overall supply and demand conditions for recent S&E graduates in the United States. Among these measures are median annual salaries, unemployment rates, and in-field employment rates.

<sup>16</sup>Data for this section are taken from the 1997 National Survey of Recent College Graduates. This survey collected information on the 1997 workforce status of 1995 and 1996 bachelor's and master's degree recipients in S&E fields. Surveys of recent S&E graduates have been conducted biennially for NSF since 1978. For information on standard errors associated with survey data, see NSF (in press, a).